

Art Preservation

NASA centers conduct extensive research in coating materials for protection of spacecraft and components from the harsh environments in which they must operate. Langley Research Center has been particularly active in this type of work and the center's efforts have produced a number of coatings that have found spinoff applications.

In the mid-1980s, Langley synthesized a new class of polyimides, a group of plastic substances generally noted for resistance to high temperatures, wear and radiation. These polyimides are optically transparent, thermally stable and soluble in some common solvents.

The Getty Conservation Institute's Materials Science Group of the Conservation Research Program, Marina del Rey, California, evaluates new coating and consolidation materials for their possible application to conservation of art objects; at right, Institute scientist Eric Hansen is investigating the properties of a polymer solution. The Institute became interested in the Langley polyimides because of their apparent stability and because they offer deposition of nearly colorless thin films on art objects. The Institutes had two important applications in mind: protection of medieval stained glass windows and prevention of corrosion on outdoor bronze sculptures.

The Materials Science Group evaluated the polyimides, under conditions simulating indoor and outdoor exposures, for changes in color, permeability and flexibility induced by ultraviolet radiation in the atmosphere. Special tests were conducted on stained glass windows in the Cathedral of Leon, Spain and on outdoor bronzes.

The stained glass window application did not prove out but one of the Langley coatings — known as ODP-3, 3-ODA — appeared after preliminary screening to be a candidate for coating outdoor bronze statuary. The need for

protecting bronzes from corrosion involves thousands of pieces from antiquity to recent times in locations all over the world; it is a particular problem in the hot, humid climates of Africa and Asia.

